**Induction: “As A New Teacher You Can Become Really Skilled, If Just Supported A Little Bit In The Right Direction”**

**Keywords:** Induction program, Beginning Teachers, Mathematics Teaching, Mentoring, Teacher Identity

**Network:**

24. *Mathematics Education Research:* As a network we would like to encourage contributions relating to all fields of mathematics education research, and in particular those comparing across regions and cultures

**Abstract:**

In Denmark, 1 in 6 new teachers leave the teaching profession during the first year (Arbejderbevægelsens Erhvervsråd, 2016). Acknowledging such challenges more generally, OECD (2010) identifies a need for coherent, system-wide induction programs since they “can contribute to the development of a learning culture within schools. ... [Where] The mentor plays a crucial role in creating an environment in which the input from beginning teachers is welcomed and taken seriously, and in fostering a learning culture within the school as a whole” (p.15). Some European countries have a top-level regulated, formalized induction program and many countries have some mandatory types of initial support often including mentoring by an experienced teacher and professional development activities (e.g. seminars) (Eurydice, 2018). Denmark has no top-level authority regulation regarding induction at all (ibid). However, more than half of the beginning Danish teachers are allotted a local mentor. This mentoring focuses on practical and general aspects of the teaching although beginning teachers report difficulties specifically related to their subjects, e.g. formulation of subject-specific goals and organization of teaching for students’ individual subject-specific needs (EVA, 2011).

Even though beginning teachers can be an important source of inspiration, most often they are quickly integrated into an existing school culture (OECD, 2010). Studies in Denmark show how beginning mathematics teachers with strong reform-oriented visions (NCTM, 2000) influenced by their teacher education quickly begin to draw more on practices from their own schooling and collegial collaboration rather than on their teacher education (J. Skott, 2019; J. Skott, Larsen, & Østergaard, 2011). Particularly in mathematics education, there is a disconnection between the current reform-oriented practices that student teachers learn during education and the traditional practices still found in many classrooms (McGinnis, Parker, & Graebner, 2004). In attempting to overcome this gap between theoretical visions and their adaptation to specific classes beginning teachers are easily influenced by colleagues with more experience and the school context (Schwartz & Ticknor, 2018). This underlines the central role of the mentor in the initial support.

Thus, there is a need for a model for induction that focuses specifically on challenges related to the teaching of mathematics and that aims to foster a supportive culture of collaboration at the schools. In the present pilot, our design of such a model for beginning teachers in primary and lower secondary school is based on three research-based recommendations (OECD, 2010). Our model is *comprehensive* in the sense that it is highly structured in terms of well-defined roles and activities for both the beginning teachers, their mentors (mathematics teachers, often educated as coaches) and two teacher educators (the two last authors). It focuses on *professional learning* by departing from challenges related to the teaching and learning of mathematics as experienced by the new teachers during their first years. The model promotes *collaboration* by offering the mentors a module on how to develop mathematics teaching collaboratively focusing on their roles and by involving pairs of new teachers and their mentors, and the teacher educators in rounds of joint observations of this new teacher’s teaching and subsequent reflection discussions.
To inform the dynamic subject-specific content of our model, the first part of our research study examines the challenges faced initially by beginning mathematics teachers. In the second part, our aim is to investigate how individual teachers develop their professional identity as an outcome of co-participating in the induction-program together with their local mentor. For this purpose, we use a theoretical framework, *Patterns-of-Participation*, which defines professional identity as a teacher’s “shifting experiences of being, becoming, and belonging as they relate to the profession” (J. Skott, 2019, p.2).

**Methods section:**
Our study is a multiple case study (Cohen, Manion, & Morrison, 2011) focusing on three cases of beginning teachers during their two first years of teaching mathematics. In order to gain insights into their images of being a good mathematics teacher before entering the teaching profession, and their initial experienced challenges as mathematics teachers, we conducted a semi-structured group-interview with five new teachers in January. Based on this interview, we selected three teachers to follow more intensively as they experienced educational challenges closely related to the subject matter. In addition, they share the characteristics of having graduated as mathematics teachers in the summer of 2018 from two university colleges in Copenhagen, getting employment in August at three different schools where both the leadership and a local mentor have agreed to participate in the induction-program, and sharing strong visions for teaching mathematics inspired by the reform. With the purpose of constructing three rich case-based narratives, we will observe the teaching of each teacher both before and after their participation in the program followed by interviews, and in three program-specific rounds of joint observation and reflection discussions as described above. Moreover, we will conduct two semi-structured interviews with 1) all five beginning teachers, and 2) they and their mentors, focusing on the kind of support the new teachers receive, the collaboration between them and their mentors, and the design of the induction model.

Inspired by grounded theory we coded the transcription of the first interview without using pre-defined codes (Charmaz, 2014). By using gerunds, we constructed initial codes such as ‘experiencing students’ struggle with inquiry-based activities’ and ‘expressing conflicts between expectations to her role as a teacher and her actual teaching decisions’ in order to keep a process perspective. By assembling these codes, we constructed a first profile of each teacher including their initial images of themselves as a mathematics teacher, and the ways their experienced difficulties challenge these images (see below). We will use the same analytical approach in the second part of our study, though with a specific focus on the multiple practices and discourses the beginning teachers engage in primarily during classroom interactions (J. Skott, 2019). Hereby, we intent to identify initial patterns of participation for each new teacher based on the first observations supplied by interviews, and analyze if, and eventually how and why these patterns of participation shift during the induction-program.

**Conclusions:**
Our preliminary analysis of the first interview shows a general characteristic of the three beginning teachers. During their first half year as mathematics teachers, their otherwise powerful visions of being good mathematics teachers inspired by reform-orientations have burst, and they have all resorted to teach in a product-oriented way relying heavily on their teaching materials. For example, one teacher envisioned herself as engaging students in inquiry-based activities “I really wanted to be this inquiring mathematics teacher” and in rich mathematical dialogues “There should be much more dialogues about mathematics because you understand it much better when talking about it”. However, as she experiences students’ frustrations and despair towards the mathematical investigations, and repeatedly finds herself in unexpected classroom interactions unable to decide on how to handle these in term of her teacher
education, she gradually loses her initial strong orientations. In seeking new directions, her school organises no formal collegial support and the leadership proves unable to help her. Feeling overwhelmed by her loneliness and pondering on the lack of support “as a new teacher you can become really skilled, if just supported a little bit in the right direction”, she resorts to adjust her teaching approach in relation to the students’ reactions: “Just by looking at them, I realised that they didn’t profit at all [by inquiry activities]. ... Also a reason for me to give up on inquiries”.

At our presentation, we will supply elaborated profiles of the two other teachers and contribute analyses of potential shifts in all three teachers’ patterns-of-participation and explanations for these shifts. Moreover, we will provide suggestions for the ways in which their co-participations in the induction-program seem to contribute to their formation of professional identity in terms of their shifting experiences of being, becoming and belonging as mathematics teachers at their schools.

References: